Attorney Docket: 071469-0306511
Client Reference: PC6025A

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A reduced maintenance processing system for treating a substrate comprising:

a chemical treatment system for chemically altering exposed surface layers on the substrate comprising a temperature controlled chemical treatment chamber having a protective barrier formed on at least a portion of an interior surface;

a thermal treatment system for thermally treating the chemically altered surface layers on the substrate, the thermal treatment system comprising a temperature controlled thermal treatment chamber having a protective barrier formed on at least a portion of an interior surface; and

a thermal insulation assembly coupled to the thermal treatment system and the chemical treatment system,

wherein the protective barrier on at least a portion of the interior surface of the chemical treatment system or the thermal treatment system comprises at least one of Al_2O_3, Y_2O_3, Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, and DyO_3.

2. (Original) The processing system as claimed in claim 1, wherein the thermal insulation assembly comprises a protective barrier on at least one exposed surface.

3. (Original) The processing system as claimed in claim 1, wherein:

the chemical treatment system further comprises a temperature controlled substrate holder mounted within the chemical treatment chamber and having a protective barrier formed on at least a portion of an exposed surface, a vacuum pumping system coupled to the chemical treatment chamber, and a gas distribution plate comprising a plurality of gas injection orifices and having a protective barrier formed on at least a portion of an exposed surface of the gas distribution plate and at least a portion of an exposed surface of each orifice, wherein the gas distribution plate

is coupled to a temperature controlled gas distribution system for introducing a process gas into the chemical treatment chamber;

the thermal treatment system further comprises a temperature controlled substrate holder mounted within the thermal treatment chamber and having a protective barrier formed on at least a portion of an exposed surface, and a vacuum pumping system coupled to the thermal treatment chamber; and

the processing system further comprises a control system coupled to the chemical treatment system and the thermal treatment system, and configured to control at least one of a chemical treatment chamber temperature, a chemical treatment gas distribution system temperature, a chemical treatment substrate holder temperature, a chemical treatment substrate temperature, a chemical treatment processing pressure, a chemical treatment gas flow rate, a thermal treatment chamber temperature, a thermal treatment substrate holder temperature, a thermal treatment substrate temperature, a thermal treatment processing pressure, and a thermal treatment gas flow rate.

4. (Withdrawn) The processing system as claimed in claim 1, wherein the protective barrier on the interior surface of the chemical treatment chamber comprises an anodized metal impregnated with PTFE and/or TFE.

5. (Withdrawn) The processing system as claimed in claim 4, wherein the protective barrier on the interior surface of the chemical treatment chamber comprises a hard anodized metal impregnated with TFE and/or PTFE.

6. (Withdrawn) The processing system as claimed in claim 4, wherein the metal comprises at least one of aluminum and an aluminum alloy.

7. (Original) The processing system as claimed in claim 1, wherein the protective barrier on the interior surface of the chemical treatment chamber comprises at least one of Al_2O_3, Y_2O_3, Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, and DyO_3.

8. (Withdrawn) The processing system as claimed in claim 1, wherein the chemical treatment system further comprises a temperature controlled substrate holder having a protective barrier formed on at least a portion thereof, the protective barrier on the temperature controlled substrate holder mounted within the chemical treatment chamber comprising an anodized metal impregnated with PTFE and/or TFE.

9. (Original) The processing system as claimed in claim 1, wherein the chemical treatment system further comprises a temperature controlled substrate holder having a protective barrier formed on at least a portion thereof, the protective barrier on the temperature controlled substrate holder mounted within the chemical treatment chamber comprising at least one of Al_2O_3, Y_2O_3, Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, and DyO_3.

10. (Withdrawn) The processing system as claimed in claim 1, wherein the chemical treatment system further comprises a gas distribution plate comprising a plurality of gas injection orifices and having a protective barrier formed on at least a portion of an exposed surface of the gas distribution plate and at least a portion of an exposed surface of each orifice, wherein the gas distribution plate is coupled to a temperature controlled gas distribution system for introducing a process gas into the chemical treatment chamber, the protective barrier on the gas distribution plate and the protective barrier on each orifice comprises an anodized metal impregnated with PTFE and/or TFE.

11. (Withdrawn) The processing system as claimed in claim 10, wherein the protective barrier on the exposed surface of the gas distribution plate and the protective barrier on the exposed surface of each orifice comprises a hard anodized metal impregnated with TFE and/or PTFE.

12. (Withdrawn) The processing system as claimed in claim 10, wherein the metal comprises at least one of aluminum and an aluminum alloy

13. (Original) The processing system as claimed in claim 1, wherein the chemical treatment system further comprises a gas distribution plate comprising a plurality of gas injection orifices and having a protective barrier formed on at least a portion of an exposed surface of the gas distribution plate and at least a portion of an exposed surface of each orifice, wherein the gas distribution plate is coupled to a temperature controlled gas distribution system for introducing a process gas into the chemical treatment chamber, the protective barrier on the exposed surface of the gas distribution plate and the protective barrier on the exposed surface of each orifice comprises at least one of Al_2O_3, Y_2O_3, Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, and DyO_3.

14. (Withdrawn) The processing system as claimed in claim 1, wherein the protective barrier on the interior surface of temperature controlled thermal treatment chamber comprises an anodized metal impregnated with PTFE and/or TFE.

15. (Withdrawn) The processing system as claimed in claim 14, wherein the protective barrier on the interior surface of the temperature controlled thermal treatment chamber comprises a hard anodized metal impregnated with TFE and or PTFE.

16. (Withdrawn) The processing system as claimed in claim 14, wherein the metal comprises at least one of aluminum and an aluminum alloy.

17. (Original) The processing system as claimed in claim 1, wherein the protective barrier on the interior surface of temperature controlled thermal treatment chamber comprises at least one of Al_2O_3, Y_2O_3, Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, and DyO_3.

18. (Withdrawn) The processing system as claimed in claim 1, wherein the thermal treatment system further comprises a temperature controlled substrate holder mounted within the thermal treatment chamber and having a protective barrier formed on at least a portion of an exposed surface, the protective barrier on the

exposed surface of the temperature controlled substrate holder mounted within the temperature controlled thermal treatment chamber comprises an anodized metal impregnated with PTFE and/or TFE.

19. (Original) The processing system as claimed in claim 1, wherein the thermal treatment system further comprises a temperature controlled substrate holder mounted within the thermal treatment chamber and having a protective barrier formed on at least a portion of an exposed surface, the protective barrier on the exposed surface of the temperature controlled substrate holder mounted within the temperature controlled thermal treatment chamber comprises at least one of Al_2O_3, Y_2O_3, Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, and DyO_3.

20. (Original) The processing system as claimed in claim 1, wherein the thermal insulation assembly comprises a gate valve assembly, wherein a protective barrier is formed on at least a portion of an exposed surface of the gate valve assembly.

21. (Withdrawn) The processing system as claimed in claim 20, wherein the protective barrier on the exposed surface of the gate valve assembly comprises an anodized metal impregnated with PTFE and/or TFE.

22. (Original) The processing system as claimed in claim 20, wherein the protective barrier on the exposed surface of the gate valve assembly comprises at least one of Al_2O_3, Y_2O_3, Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, and DyO_3.

23. (Withdrawn) The processing system as claimed in claim 10, wherein the process gas comprises a first gas and a second gas.

24. (Withdrawn) The processing system as claimed in claim 23, wherein the first gas comprises at least one of NH_3, HF, H_2, O_2, CO, CO_2, Ar, He, and N_2.

25. (Withdrawn) The processing system as claimed in claim 23, wherein the second gas comprises at least one of NH_3, HF, H_2, O_2, CO, CO_2, Ar, He, and N_2

26. (Withdrawn) The processing system as claimed in claim 23, wherein the plurality of orifices comprises a first array of orifices for coupling the first gas to the process space and a second array of orifices for coupling the second gas to the process space.

27. (Original) The processing system as claimed in claim 1, wherein the thermal treatment system further comprises a substrate lifter assembly coupled to the thermal treatment chamber for vertically translating the substrate between a transfer plane and the substrate holder.

28. (Original) The processing system as claimed in claim 27, wherein the substrate lifter assembly comprises a blade having three or more tabs for receiving the substrate and having a protective barrier formed on at least a portion of an exposed surface, and a drive system for vertically translating the substrate between the substrate holder and a transfer plane.

29. (Withdrawn) The processing system as claimed in claim 28, wherein the protective barrier on the at least one exposed surface of the blade comprises an anodized metal impregnated with PTFE and/or TFE.

30. (Original) The processing system as claimed in claim 28, wherein the protective barrier on the at least one exposed surface of the blade comprises at least one of Al_2O_3, Y_2O_3, Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, and DyO_3.

31. (Currently Amended) A chemical treatment system for chemically altering exposed surface layers on the substrate comprising:

a temperature controlled chemical treatment chamber having a protective barrier formed on at least a portion of an interior surface:

a temperature controlled substrate holder mounted within the chemical treatment chamber;

a vacuum pumping system coupled to the chemical treatment chamber; and

a gas distribution plate comprising a plurality of gas injection orifices, the gas distribution plate being coupled to a temperature controlled gas distribution system for introducing a process gas into the chemical treatment chamber,

wherein the protective barrier on the interior surface of the chemical treatment chamber comprises at least one of Al_2O_3, Y_2O_3, Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, and DyO_3.

32. (Withdrawn) The chemical treatment system as claimed in claim 31, wherein the protective barrier on the interior surface of the chemical treatment chamber comprises an anodized metal impregnated with PTFE and/or TFE.

33. (Withdrawn) The chemical treatment system as claimed in claim 32, wherein the protective barrier on the interior surface of the chemical treatment chamber comprises a hard anodized metal impregnated with TFE and/or PTFE.

34. (Withdrawn) The processing system as claimed in claim 32, wherein the metal comprises at least one of aluminum and an aluminum alloy.

35. (Canceled)

36. (Original) The chemical treatment system of claim 31, wherein the substrate holder has a protective barrier formed on at least a portion of an exposed surface.

37. (Original) The chemical treatment system of claim 31, wherein a protective barrier is formed on at least a portion of an exposed surface of the gas distribution plate and on at least a portion of an exposed surface of each orifice.

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38. (Currently Amended) A thermal treatment system for thermally treating the chemically altered surface layers on the substrate, the thermal treatment system comprising:

a temperature controlled thermal treatment chamber having a protective barrier formed on at least a portion of an interior surface;

a temperature controlled substrate holder mounted within the thermal treatment chamber;

a vacuum pumping system coupled to the thermal treatment chamber; and

a temperature controlled upper assembly coupled to the thermal treatment chamber

wherein the protective barrier on the interior surface of the thermal treatment chamber comprises at least one of Al_2O_3, Y_2O_3, Sc_2O_3, Sc_2F_3, YF_3, La_2O_3, CeO_2, Eu_2O_3, and DyO_3.

39. (Withdrawn) The thermal treatment system as claimed in claim 38, wherein the protective barrier on the interior surface of the thermal treatment chamber comprises an anodized metal impregnated with PTFE and/or TFE.

40. (Withdrawn) The thermal treatment system as claimed in claim 39, wherein the protective barrier on the interior surface of the thermal treatment chamber comprises a hard anodized metal impregnated with TFE and/or PTFE.

41. (Withdrawn) The thermal treatment system as claimed in claim 39, wherein the metal comprises at least one of aluminum and an aluminum alloy.

42. (Canceled)

43. (Original) The thermal treatment system as claimed in claim 38, wherein the substrate holder has a protective barrier formed on at least one exposed surface.

44. (Withdrawn) A method for treating a processing chamber, comprising:

anodizing at least a portion of an interior surface of the processing chamber; and

impregnating the anodized surface with PTFE and/or TFE, thereby creating a protective barrier.